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[19]中华人民共和国专利局

[51]Int.Cl<sup>6</sup>

B60T 17/00



# [12] 实用新型专利说明书

[21] ZL 专利号 96227024.5

[45]授权公告日 1997年2月5日

[11] 授权公告号 CN 2246605Y

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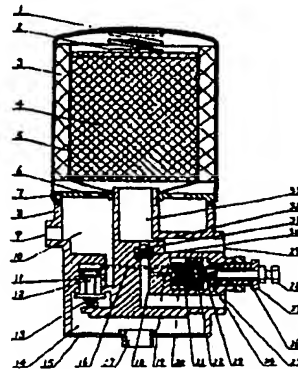
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[54]实用新型名称 汽车制动空气干燥器

[57]摘要

本实用新型提供了一种汽车制动空气干燥器，包括干燥筒、器座、再生贮气筒、滤网、喇叭罩、分子筛、预排水室、容水室、排水室、排气室、调节室、节流孔及气口，装有滤网、喇叭罩及分子筛的干燥筒安装在器座上，器座内，各室之间及气口相应相通，本实用新型结构简单、适用面广、工作安全可靠，它可使汽车气制动系统在卸荷排气过程的同时，将干燥空气反向通过分子筛使其干燥再生活化，是一项值得推广的技术。



(BJ)第 1452 号

## 权 利 要 求 书

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1、一种汽车制动空气干燥器，包括干燥筒（1）、器座（8）、再生贮气筒、滤网（3）、喇叭罩（5）、分子筛（4）、预排水室（10）、容水室（11）、排水室（14）、通道（18）、排气室（33）、调节室（20）、节流孔（32）及气口（9）、（17）、（25）、（29），其特征在于：装有滤网（3）、喇叭罩（5）及分子筛（4）的干燥筒（1）安装在器座（8）上，器座（8）内预排水室（10）的上、下端分别与干燥筒（1）及容、排水室（11）、（14）相通，排气室（33）的上、中、下端分别与干燥筒（1）、节流孔（32）及通道（18）相通，调节室（20）分别与容水室（11）、通道（18）及调节螺套（27）上的气口（26）相通，预排水室（10）、排水室（14）、通道（18）及节流孔（32）分别与气口（9）、（17）、（25）、（29）相通，气口（29）与再生贮气筒相接。

2、根据权利要求1所述的汽车制动空气干燥器，其特征在于：滤网（3）安装在干燥筒（1）与喇叭罩（5）之间的空间内，分子筛（4）安装在喇叭罩（5）内，压簧（2）的上、下端分别与干燥筒（1）顶端内壁及分子筛（4）顶端相配合，喇叭罩（5）下口及筒盘（7）分别安装在干燥筒（1）的下部，喇叭罩（5）下口与筒盘（7）中心孔相配合，带有气孔（6）的筒盘（7）圆周边沿与干燥筒（1）开口处内壁相配合，筒盘（7）上的中心孔与器座（8）内的排气室（33）

上部相配合，筒盘（7）上的气孔（6）与器座（8）内的预排水室（10）相通，干燥筒（1）通过筒盘（7）与器座（8）相密封连接。

3、根据权利要求1所述的汽车制动空气干燥器，其特征在于：带有气口（9）的预排水室（10）与容水室（11）相通，容水室（11）内有阀芯（12），阀芯（12）上的阀片与容水室（11）下口相配合，容水室（11）上有电加热装置，压簧（13）的上下端分别与阀芯（12）及器座（8）相配合，容水室（11）与带有气口（17）的排水室（14）相通，容水室（11）顶端通过通道（16）与调节室（20）相通；排气室（33）通过节流孔（32）与气口（29）相通，排气室（33）下端与通道（18）连接处安装有阀芯（31），压簧（30）的上、下端分别与阀芯（31）及器座（1）体相配合，通道（18）通过通道（19）与调节室（20）相通，通道（18）与气口（25）相通；调节室（20）的调节口处与带有气口（26）的调节螺套（27）相配合，调节螺栓（28）与调节螺套（27）相配合，调节螺套（27）与阀芯（22）相配合，调节室（20）内安装有活塞（21），活塞（21）的首端与通道（19）口相配合，压簧（24）两端分别与活塞（21）及调节螺栓（28）相配合，活塞（21）尾端与阀芯（22）首端内侧相配合，压簧（23）两端分别与阀芯（22）尾端外侧及调节室（20）内壁相配合。

# 说明书

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## 汽车制动空气干燥器

本实用新型涉及一种汽车制动空气干燥器。

众所周知，在汽车空气制动系统中，空气中含有的水分含量在空气压缩后则大幅度增加。这些水分和空压机窜出的机油一同进入汽车制动系统中，会使其金属器件锈蚀、润滑膜失效及橡胶元件老化，最终导致汽车制动系统中各种元器件在使用周期内无法保障其正常工作状态；再者，在冬季气温较低时，还会出现因制动元器件被冻住而引起其动作失灵的状况。人们为解决这一问题，有些已采用将分子筛装于干燥筒内来吸收压缩空气中水分的方式，并收到一定的效果。但是，由于分子筛所吸水分饱和后需要不断地更换，这样既不经济，操作起来也相当繁琐。由此，长期以来此种汽车制动空气干燥方式给使用及生产者带来了诸多烦恼。

本实用新型的目的是提供一种能够克服上述技术不足部分的汽车制动空气干燥器。

本实用新型的目的是这样实现的：一种汽车制动空气干燥器，包括干燥筒、器座、再生贮气筒、滤网、喇叭罩、分子筛、预排水室、容水室、排水室、排气室、调节室、节流孔及气口，装有滤网、喇叭罩及分子筛的干燥筒安装在器座上，器座内预排水室的上、下端分别与干燥筒及容、排水室相通，排气室的上、中、下端分别与干燥筒、节流孔及通道相通，调节室分别

与容水室、通道及调节螺套上的气口相通，预排水室、排水室、通道及节流孔分别与气口相通，气口与再生贮气筒相接。工作状态时，本实用新型利用其调节室卸荷排气过程，使再生贮气筒中的干燥空气反向通过分子筛，将其表面吸附的水分带走，实现分子筛的再生活化、延长使用寿命的目的。

本实用新型的优点：一、设计科学，它在现有汽车制动空气干燥器的基础上，增设了再生贮气筒贮存干燥空气，并利用调节室卸荷排气过程的同时，自动将干燥空气反向通过分子筛使其干燥再生活化；二、结构新颖，调节室采用了螺套、栓双调节及双压簧的调节结构方式，利用两个压簧的相互联动作用，实现对调节室的开启压力及压力降双功能调节；三、结构简单、便于制作、适用面广、工作安全可靠，它适合于各种气制动汽车在各种气候条件下使用。本实用新型的广泛应用能够产生较好的社会、经济效益，是一项值得推广的技术。

说明书附图为本实用新型的结构示意图。

下面参照说明书附图结合实施例对本实用新型作进一步详细描述。

本实用新型的汽车制动空气干燥器，包括干燥筒（1）、器座（8）、再生贮气筒、滤网（3）、喇叭罩（5）、分子筛（4）、预排水室（10）、容水室（11）、排水室（14）、通道（18）、排气室（33）、调节室（20）、节流孔（32）及气口（9）、（17）、（25）、（29），装有滤网（3）、喇叭罩（5）及分子筛（4）的干燥筒（1）安

装在器座（8）上，器座（8）内预排水室（10）的上、下端分别与干燥筒（1）及容、排水室（11）、（14）相通，排气室（33）的上、中、下端分别与干燥筒（1）、节流孔（32）及通道（18）相通，调节室（20）分别与容水室（11）、通道（18）及调节螺套（27）上的气口（26）相通，预排水室（10）、排水室（14）、通道（18）及节流孔（32）分别与气口（9）、（17）、（25）、（29）相通，气口（29）与再生贮气筒相接。滤网（3）安装在干燥筒（1）与喇叭罩（5）之间的空间内，分子筛（4）安装在喇叭罩（5）内，压簧（2）的上、下端分别与干燥筒（1）顶端内壁及分子筛（4）顶端相配合，喇叭罩（5）下口及筒盘（7）分别安装在干燥筒（1）的下部，喇叭罩（5）下口与筒盘（7）中心孔相配合，带有气孔（6）的筒盘（7）圆周边沿与干燥筒（1）开口处内壁相配合，筒盘（7）上的中心孔与器座（8）内的排气室（33）上部相配合，筒盘（7）上的气孔（6）与器座（8）内的预排水室（10）相通，干燥筒（1）通过筒盘（7）与器座（8）相密封连接。带有气口（9）的预排水室（10）与容水室（11）相通，容水室（11）内有阀芯（12），阀芯（12）上的阀片与容水室（11）下口相配合，容水室（11）上有电加热装置，压簧（13）的上下端分别与阀芯（12）及器座（8）相配合，容水室（11）与带有气口（17）的排水室（14）相通，

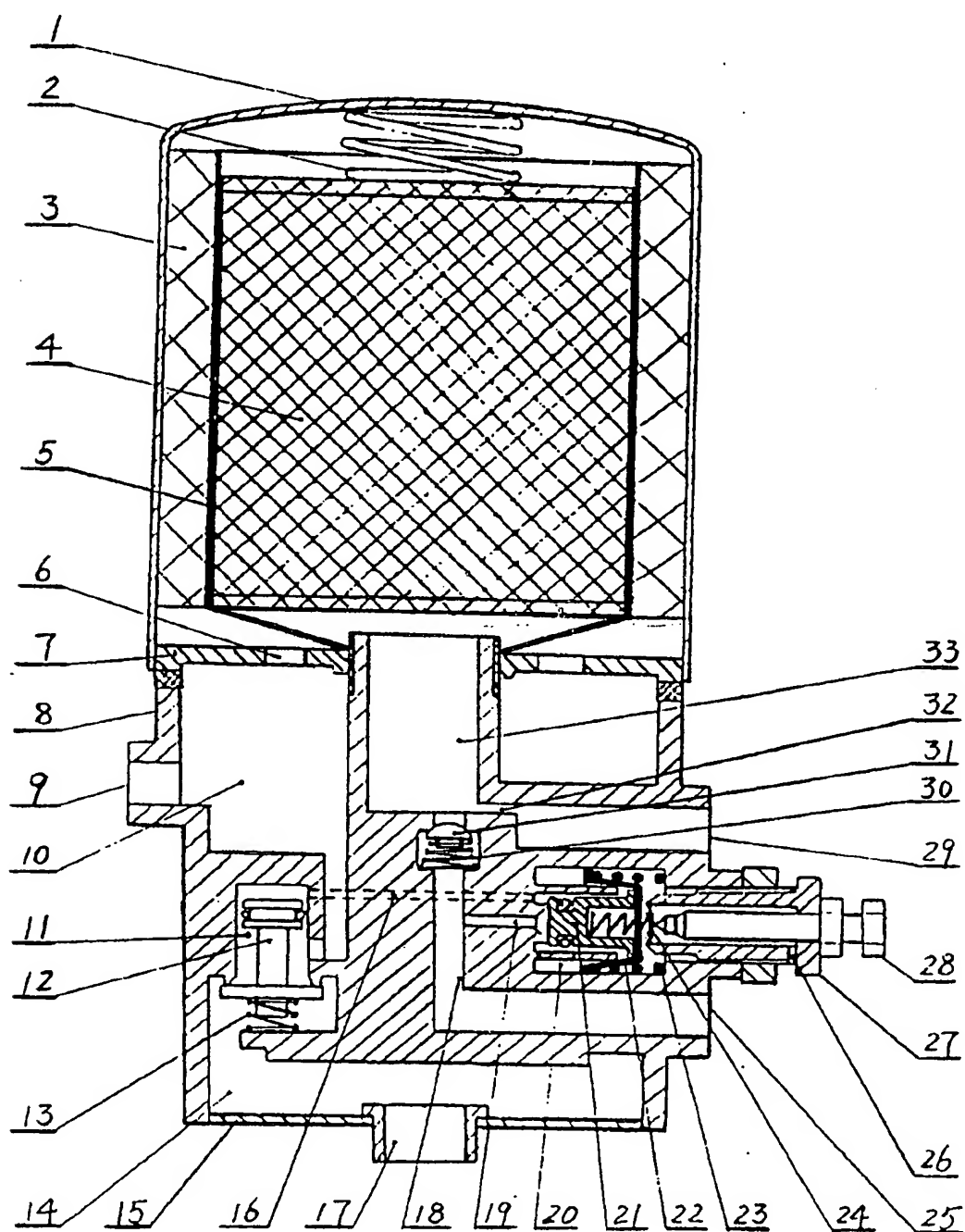
容水室（11）顶端通过通道（16）与调节室（20）相通；排气室（33）通过节流孔（32）与气口（29）相通，排气室（33）下端与通道（18）连接处安装有阀芯（31），压簧（30）的上、下端分别与阀芯（31）及器座（1）体相配合，通道（18）通过通道（19）与调节室（20）相通，通道（18）与气口（25）相通；调节室（20）的调节口处与带有气口（26）的调节螺套（27）相配合，调节螺栓（28）与调节螺套（27）相配合，调节螺套（27）与阀芯（22）相配合，调节室（20）内安装有活塞（21），活塞（21）的首端与通道（19）口相配合，压簧（24）两端分别与活塞（21）及调节螺栓（28）相配合，活塞（21）尾端与阀芯（22）首端内侧相配合，压簧（23）两端分别与阀芯（22）尾端外侧及调节室（20）内壁相配合。

制作时，按要求加工好各种零部件加以组装。使用时，将本实用新型安装在汽车所需位置后，再将汽车上的空压机出口及四回路保护阀的进口分别与本实用新型的气口（9）及（25）相接，气口（29）与再生贮气筒相接即可。工作状态时，空压机的压缩空气经气口（9）进入预排水室（10），此时压缩空气所产生的冷凝水则流到容水室（11）内，压缩空气则通过筒盘（7）上的气孔（6），经过滤网（3）到达干燥筒（1）内的上端再进入分子筛（4），此时经分子筛（4）干燥处理过的干燥空气经过排气室（33）、阀芯（31）、通



道(18)及气口(25)通向四回路保护阀,供整车气路;同时干燥空气经过排气室(33)、节流孔(32)、气口(29)流向再生贮气筒内贮存。当整个制动系统中的空气压力升高到预定卸荷值时,通道(18)内的空气则通过通道(19)使得调节室(20)内的活塞(21)移动,即形成打开通道(19)的同时关闭阀芯(22)与螺套(27)的接口配合处,此时压缩空气经过通道(16)到达容水室(11)内推动阀芯(12)动作,将从预排水室(10)进入的压缩空气及容水室(11)内的冷凝水通过排水室(14)及气口(17)排向大气;同时来自再生贮气筒的干燥空气经气口(29)、节流孔(32)、排气室(33)、干燥筒(1)、预排水室(10)、容水室(11)、排水室(14)及气口(17)排向大气,使其流经干燥筒(1)内的分子筛(4)的干燥空气将滞留在分子筛(4)表层的水分带有,以达到分子筛(4)再生活化、延长使用寿命的目的。当接四回路保护阀的气口(25)压力下降至工作气压值时,活塞(21)在压簧(23)、(24)作用下运动,即通道(19)关闭,阀芯(22)与螺套(27)的接口配合处打开,容水室(11)内阀芯(12)上端剩余的空气经过通道(16)进入调节室(20)内,并通过气口(26)排出,容水室(11)内阀芯(12)的向上复位,则使阀片关闭容水室(11)下口,整个排气过程完成。下一个排气过程以此类推。再生贮气筒及容水室(11)上的电加热装置均为现有技术,这里就不一一赘述。

# 说明书附图



CN2246605Y

## Automobile Braking Air Dryer

### Description

The present utility model relates to an air dryer for braking an automobile.

As is well known, in an air braking system of an automobile, the moisture in air will greatly increase after air is compressed. If such moisture along with engine oil escaping from an air compressor enters the automobile braking system, they will make metal parts get rusty and corrosive, invalidate the lubricant film and make rubber component parts aging and eventually cause various component parts in the automobile braking system to fail to maintain their normal operation states in their working cycle. Furthermore, at relatively low temperature in winter, braking elements will malfunction because they are frozen. To solve this problem, some people have provided a molecular sieve within the drying cylinder to absorb the moisture in the compressed air and have reached a certain effect. But after the molecular sieve get saturated due to the absorbed moisture, it needs to be changed constantly, which is not economical and rather complicated in manipulation. For this reasons, this automobile braking air drying manner in the long past has brought about so much trouble and annoyance to users and manufacturers.

An object of the present utility model is to provide an automobile braking air dryer that can overcome the above technical disadvantages.

The above object is realized as follows: an automobile braking air dryer, comprising a drying cylinder, a seat, a regenerative air tank, a filter screen, a horn cover, a molecular sieve, a pre-drainage chamber, a water receiving chamber, a drainage chamber, an exhaust chamber, an regulating chamber, a throttling orifice and air port, wherein the drying cylinder provided with the filter screen, the horn cover and the molecular sieve is disposed on the seat in which an upper end and a lower end of the pre-drainage chamber respectively communicate with the drying cylinder and the water receiving chamber and drainage chamber, upper, middle and lower ends of the exhaust chamber respectively communicate with drying cylinder, the throttling

orifice and a passageway, the regulating chamber respectively communicates with the water receiving chamber, the passageway, and the air port on an regulating threaded sheath, the pre-drainage chamber, drainage chamber, the passageway and the throttling orifice respectively communicates with the air port, and wherein the air port is connected to the regenerative air tank. In the working state according to the present utility model, the regulating chamber unload the exhaust process so as to allow the drying air in the regenerative air tank to run through the molecular sieve in an opposite direction and take away the moisture absorbed on the surface thereof, thereby realizing the object of the revitalization and longevity in use of the molecular sieve.

The present utility model has the following advantages: (1) scientific design. On the basis of present-day automobile braking air dryer, the present utility model provides a regenerative air tank to store the dry air, and automatically allow the dry air to run through the molecular sieve in an opposite direction to revitalize the drying thereof whilst the regulating chamber is used to unload the exhaust process. (2) novel configuration. The regulating chamber is subjected to a regulating manner by virtue of a threaded sheath, double bolt regulation and double pressure springs so that the regulation of dual functions of the regulating chamber, i.e., initiation of pressure and pressure drop, is effected by the interlinkage of the two pressure springs. (3) The air dryer is simple in structure, easy for production, adapted to a wide scope, and safe and reliable in operation. The air dryer is adapted to various air-brake automobiles in a variety of weather and climate conditions. The wide application of the present utility model can result in fairly good social and economic benefits, which is a technology worthy of being spread.

The drawing of the description is a structural schematic view of the present utility model.

The present utility model will be further described in detail with reference to the drawing and in combination with the embodiments.

The automobile braking air dryer according to the present utility model comprises a drying cylinder (1), a seat (8), a regenerative air tank, a filter screen (3), a horn

cover (5), a molecular sieve (4), a pre-drainage chamber (10), a water receiving chamber (11), a drainage chamber (14), a passageway (18), an exhaust chamber (33), an regulating chamber (20), a throttling orifice (32) and air port (9), (17), (25), (29), wherein the drying cylinder (1) provided with the filter screen (3), the horn cover (5) and the molecular sieve (4) is disposed on the seat (8) in which an upper end and a lower end of the pre-drainage chamber (10) respectively communicate with the drying cylinder (1) and the water receiving chamber (11) and drainage chamber (14), upper, middle and lower ends of the exhaust chamber (33) respectively communicate with drying cylinder (1), the throttling orifice (32) and the passageway (18), the regulating chamber (20) respectively communicates with the water receiving chamber (11), the passageway (18), and the air port (26) on an regulating threaded sheath (27), the pre-drainage chamber (10), drainage chamber (14), the passageway (18) and the throttling orifice (32) respectively communicates with the air port (9), (17), (25), (29), and wherein the air port (29) is connected to the regenerative air tank. The filter screen (3) is disposed within the space between the drying cylinder (1) and the horn cover (5); the molecular sieve (4) is disposed within the horn cover (5); the upper and lower ends of the pressure (2) respectively cooperate with a top end inner wall of the drying cylinder (1) and a top end of the molecular sieve (4); the lower mouth of the horn cover (5) and a cylinder plate (7) are respectively mounted on the lower portion of the drying cylinder (1); the lower mouth of the horn cover (5) cooperates with a central hole of the cylinder plate (7); the circumferential edge of the cylinder plate (7) with the air port (6) cooperates with the inner wall of the opening of the drying cylinder (1); the central hole of the cylinder plate (7) cooperates with the upper portion of the exhaust chamber (33) within the seat (8); the air port (6) of the cylinder plate (7) communicates with the pre-drainage chamber (10) within the seat (8); the drying cylinder (1) is sealingly connected to the seat (8) via the cylinder plate (7); the pre-drainage chamber (10) with the air port (9) communicates with the water receiving chamber (11); the water receiving chamber (11) is provided therein with a valve core (12); the valve block on the valve core (12) cooperates with the lower mouth of the water receiving chamber (11); the water receiving chamber (11) is provided with an

electrical heating means; the upper and lower ends of the pressure spring (13) respectively cooperate with the valve core (12) and the seat (8); the water receiving chamber (11) communicates with the drainage chamber (14) having the air port (17); the top end of the water receiving chamber (11) communicates with the regulating chamber (20) via the passageway (16); the exhaust chamber (33) communicates with the air port (29) via the throttling orifice (32); a valve core (31) is provided at the joint of the lower end of the exhaust chamber (33) and the passageway (18); the upper and lower ends of the pressure spring (30) cooperate with the valve core (31) and the seat (1); the passageway (18) communicates with the regulating chamber (20) via a passageway (19); the passageway (18) communicates with the air port (25); the regulating mouth of the regulating chamber (20) cooperates with the regulating threaded sheath (27) having the air port (26); the regulating threaded bolt (28) cooperates with the regulating threaded sheath (27); the regulating threaded sheath (27) cooperates with the valve core (22); the piston (21) is provided within the regulating chamber (20); the leading end of the piston (21) cooperates with the passageway (19) mouth; both ends of the pressure spring (24) cooperates respectively with the piston (21) and the regulating threaded bolt (28); the trailing end of the piston (21) cooperates with the inner side of the leading end of the valve core (22); both ends of the pressure spring (23) respectively cooperate with the outer side of the trailing end of the valve core (22) and the inner wall of the regulating chamber (20).

On producing the air dryer, various parts are processed as required and then be assembled. In use, the air dryer according to the present utility model is mounted on the desired position of the automobile, and then outlet of the air compressor and the inlet of the four-circuit protective valve are respectively connected to the air ports (9) and (25) of the present utility model, and finally, the air port (29) is connected to the regenerative air tank. In the working state, the compressed air of the air compressor enters the pre-drainage chamber (10) through the air port (9), whereupon the condensed water generated by the compressed air flows into the water receiving chamber (11), the compressed air reaches the upper end within the drying cylinder (1) and then enters the molecular sieve (4) through the air port (6) on the cylinder plate (7)

and through the filter screen (3) whereupon the dry air dried by the molecular sieve (4) communicates toward the four-circuit protective valve through the exhaust chamber (33), the valve core (31), the passageway (18) and the air port (25) to supply the air circuit for the whole automobile; in the meantime, the dry air flows towards the regenerative air tank for storage through the exhaust chamber (33), the throttling orifice (32) and the air port (29). When the air pressure in the whole braking system rises to a predetermined unloading value, the air in the passageway (18) will run through the passageway (19) to allow the piston (21) in the regulating chamber (20) to move, i.e., opening the passageway (19) whilst closing the interface between the valve core (22) and the threaded sheath (27), whereupon the compressed air reaches the inside of the water receiving chamber (11) via the passageway (16) to push the valve core (12) to operate; the compressed air entering through the pre-drainage chamber (10) and the condensed water within the water receiving chamber (11) are discharged to the atmosphere via the drainage chamber (14) and the air port (17); meanwhile the dry air from the regenerative air tank is discharged into the atmosphere via the air port (29), the throttling orifice (32), the exhaust chamber (33), the drying cylinder (1), the pre-drainage chamber (10), the water receiving chamber (11), the drainage chamber (14) and the air port (17), and it flow through the molecular sieve (4) within the drying cylinder (1) and take away the moisture lingering on the surface of the molecular sieve (4), thereby realizing the object of revitalization and prolonging of working life of the molecular sieve (4). When the pressure at the air port (25) connected to the four-circuit protective valve falls down to a working air pressure value, the piston (21) moves under the action of the pressure spring (23) (24), that is, the passageway (19) closes and the interface between the valve core (22) and threaded sheath (27) opens, and the remaining air at the upper end of the valve core (12) within the water receiving chamber (11) enters the regulating chamber (20) via the passageway (16) and is discharged through the air port (26), the valve core (12) within the water receiving chamber (11) moves upwardly to the original position so that the valve block will close the lower mouth of the water receiving chamber, whereupon the whole exhaust process is finished. The next exhaust process goes in

the same way. The regenerative air tank and the electrical heating means on the water receiving chamber (11) are both prior art, and therefore will not be specified in detail herein.

### Claims

1. An automobile braking air dryer, comprising a drying cylinder (1), a seat (8), a regenerative air tank, a filter screen (3), a horn cover (5), a molecular sieve (4), a pre-drainage chamber (10), a water receiving chamber (11), a drainage chamber (14), a passageway (18), an exhaust chamber (33), an regulating chamber (20), a throttling orifice (32) and air port (9), (17), (25), (29), characterized in that the drying cylinder (1) provided with the filter screen (3), the horn cover (5) and the molecular sieve (4) is disposed on the seat (8) in which an upper end and a lower end of the pre-drainage chamber (10) respectively communicate with the drying cylinder (1) and the water receiving chamber (11) and drainage chamber (14), upper, middle and lower ends of the exhaust chamber (33) respectively communicate with drying cylinder (1), the throttling orifice (32) and the passageway (18), the regulating chamber (20) respectively communicates with the water receiving chamber (11), the passageway (18), and the air port (26) on an regulating threaded sheath (27), the pre-drainage chamber (10), drainage chamber (14), the passageway (18) and the throttling orifice (32) respectively communicate with the air port (9), (17), (25), (29), and characterized in that the air port (29) is connected to the regenerative air tank.

2. The automobile braking air dryer as claimed in claim 1, characterized in that the filter screen (3) is disposed within the space between the drying cylinder (1) and the horn cover (5), the molecular sieve (4) is disposed within the horn cover (5), the upper and lower ends of the pressure (2) respectively cooperate with a top end inner wall of the drying cylinder (1) and a top end of the molecular sieve (4), the lower mouth of the horn cover (5) and a cylinder plate (7) are respectively mounted on the lower portion of the drying cylinder (1), the lower mouth of the horn cover (5) cooperates with a central hole of the cylinder plate (7), the circumferential edge of the cylinder plate (7) with the air port (6) cooperates with the inner wall of the opening of the



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drying cylinder (1), the central hole of the cylinder plate (7) cooperates with the upper portion of the exhaust chamber (33) within the seat (8), the air port (6) of the cylinder plate (7) communicates with the pre-drainage chamber (10) within the seat (8), and characterized in that the drying cylinder (1) is sealingly connected to the seat (8) via the cylinder plate (7).

3. The automobile braking air dryer as claimed in claim 1, characterized in that the pre-drainage chamber (10) with the air port (9) communicates with the water receiving chamber (11), the water receiving chamber (11) is provided therein with a valve core (12), the valve block on the valve core (12) cooperates with the lower mouth of the water receiving chamber (11), the water receiving chamber (11) is provided with an electrical heating means; the upper and lower ends of the pressure spring (13) respectively cooperate with the valve core (12) and the seat (8), the water receiving chamber (11) communicates with the drainage chamber (14) having the air port (17), the top end of the water receiving chamber (11) communicates with the regulating chamber (20) via the passageway (16), the exhaust chamber (33) communicates with the air port (29) via the throttling orifice (32), a valve core (31) is provided at the joint of the lower end of the exhaust chamber (33) and the passageway (18), the upper and lower ends of the pressure spring (30) respectively cooperate with the valve core (31) and the seat (1), the passageway (18) communicates with the regulating chamber (20) via a passageway (19), the passageway (18) communicates with the air port (25), the regulating mouth of the regulating chamber (20) cooperates with the regulating threaded sheath (27) having the air port (26), the regulating threaded bolt (28) cooperates with the regulating threaded sheath (27), the regulating threaded sheath (27) cooperates with the valve core (22), the piston (21) is provided within the regulating chamber (20), the leading end of the piston (21) cooperates with the passageway (19) mouth, both ends of the pressure spring (24) cooperates respectively with the piston (21) and the regulating threaded bolt (28), the trailing end of the piston (21) cooperates with the inner side of the leading end of the valve core (22), both ends of the pressure spring (23) respectively cooperate with the outer side of the trailing end of the valve core (22) and the inner wall of the regulating chamber

### Abstract

The automobile braking air dryer according to the present utility model, comprising a drying cylinder, a seat, a regenerative air tank, a filter screen, a horn cover, a molecular sieve, a pre-drainage chamber, a water receiving chamber, a drainage chamber, an exhaust chamber, an regulating chamber, a throttling orifice and air port, wherein the drying cylinder provided with the filter screen, the horn cover and the molecular sieve is disposed on the seat. In the seat, all chambers communicate with one another and they communicate with the air ports. The air dryer according to the present utility model is simple in structure, adapted to a wide scope, and safe and reliable in operation. The air dryer allows the dry air to run through the molecular sieve in an opposite direction to revitalize the drying thereof whilst the automobile air-brake system enters the unloading and exhausting process.